

TRANSVESICAL CAUTERIZATION AS A SUBSTITUTE FOR THE BOTTINI OPERATION IN THE TREATMENT OF SOME FORMS OF PROSTATIC HYPERTROPHY.¹

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THE treatment of hypertrophy of the prostate gland has been, until recently, distinctly palliative. Operative procedures have been advised only as measures of last resort when the obstruction or some of the secondary pathological processes incident thereto have threatened the life of the patient.

The practicability and value of various operations have been so frequently demonstrated, even in cases of apparently hopeless gravity, that surgeons generally now advise operative measures as affording the most rational means of treatment for this distressing condition.

Having demonstrated the practicability and rationality of operative treatment, attention should now be directed to perfecting the operative technique and to convincing the general practitioner, into whose care these cases first come, that prolonged catheterism, even under the most favorable circumstances, is a dangerous practice; that operative measures are safe and effective, and that the earlier they are employed the safer the treatment and the more gratifying the immediate and permanent results.

The views of writers as to the relative value of these operations vary with their conception of the conditions which cause the obstruction, and as to the immediate and permanent effects of the different procedures upon the local tissues, and also as to the ease and relative safety of the operations them-

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selves. Fenwick,¹ for example, believes that 90 per cent. of prostatic obstructions are due to enlargement of the middle lobe. Hutchinson,² McGill,³ Kummel,⁴ and Browne⁵ believe intravesical enlargement to be the principal cause of obstruction. The experiments of Von Kittel⁶ demonstrate the effects of lateral enlargements, which is confirmatory of his clinical observations and those of many others.

In attempting to ascertain the relative merits and safety of the various procedures now employed, we naturally study the published statistics in connection with the technique and applicability of the individual operations. While the statistics demonstrate that most of the operations are reasonably safe, and of distinct value when employed in proper cases and in accordance with the well established rules of prudent surgery, they are very unsatisfying as to the relative merits of the various operations. When surgeons of great prominence differ widely as to the mortality rate of an operation, even when based upon the same tables, the unreliability of the conclusions must be apparent.⁷

The more one attempts to harmonize the different conclusions, the stronger is he impressed with the lack of judicial consideration of the real merits of the cases by those who have presumed to make deductions therefrom. The results are such as we would expect from over-enthusiastic partisans rather than from scientific searchers for the facts. It must have been statistics such as these which long ago called forth the observation "that you cannot prove anything by numbers."

As indicated in the title of this paper, it is not my purpose to discuss the indications for and the relative merits of the numerous operative procedures which have been and are now being advocated for the treatment of prostatic hypertrophy, but simply to call attention to some of the objections to the Bottini operation as now performed, and to advocate the application of the cautery through a suprapubic cystotomy opening as a substitute for the urethral route in some of those conditions in which the Bottini operation seems to have been particularly successful.

Professor Bottini first employed the galvano-cautery in the treatment of hypertrophy of the prostate in 1872, nearly thirty years ago.⁸ Notwithstanding its repeated performance and the publication of the procedure,^{9, 10} it did not seem to meet with general recognition as a feasible procedure until about 1897, although Clarke¹¹ had reported three cures in four cases in 1892, and Freudenberg and a few others had been employing it considerably.

The original Bottini instrument has been largely replaced by the Freudenberg modification. The improvement recently devised by H. H. Young,¹² of Baltimore, would seem to justify the early substitution of his modifications for the Freudenberg model, as it adds greatly to the safety and accuracy of the operation.

It was the evident purpose of Bottini to utilize the element of destruction of tissue as a means of immediately removing the mechanical obstruction to urination, and, secondarily, to obtain diminution in the size of the enlargement as a result of the modification of its circulation and of the cicatrization which would follow the deep cauterization, just as is experienced when the cautery is employed to hypertrophied tissues in the nose.

There can be no question but that any form of prostaticotomy which removes the immediate mechanical cause of the obstruction will afford temporary relief. The question, however, upon which much doubt is entertained, and which has been the subject of much discussion is, "What is the permanent effect of the cauterization upon the general hypertrophy or enlargement of the gland?"

If in addition to immediately relieving the obstruction it causes permanent shrinkage of the gland and prevents recurrence of obstruction, as claimed by its enthusiastic supporters, then we must all agree that the Bottini idea of cauterization is correct in principle, although we may choose to criticise and to absolutely reject his method of applying it.

The great question is as to the value of the cauterization; the method of application, of which we are to treat, is really

of secondary importance, but, nevertheless, essential to the success of its application.

In the first seventy-seven cases operated upon, Bottini¹³ reported fifty-two (67.6 per cent.) as completely cured; eleven (14.3 per cent.) as improved; twelve (15.6 per cent.) as not benefited, with a mortality of two (2.6 per cent.).

Freudenberg collected reports of 752 cases, in which the result was good in 86.6 per cent., a failure in 6.7 per cent., with a mortality of about 4.5 per cent.¹⁴ Bangs¹⁵ reports forty-two Bottini operations. Over 60 per cent. had discarded the use of the catheter, about 20 per cent. had been benefited and 20 per cent. were not benefited, and of these three died from shock and sepsis.

H. H. Young¹² would leave us to imply that of forty-one cases all were improved except the three who died, all of whom were in very bad condition before the operation.

Kreissl, in a personal communication, reports sixty-five operations with forty-one (63 per cent.) satisfactory results, four being after repeated operations; fifteen (23 per cent.) improved as to tenesmus, calls to urinate, and reduced urine; three (4.6 per cent.) not benefited and two (3 per cent.) deaths.

Such reports are certainly most gratifying, and, as Young states,¹² "if correct, undoubtedly shows much better results than can be claimed for any other operative procedure."

To these statistics should be added the experience and careful analysis of Horwitz.¹⁶ He reports thirty-three operations without mortality. Of fourteen cases requiring catheterization, but free from secondary pathological changes, all made perfect recoveries. Of eight cases with beginning bladder changes and constant use of catheter required, but patients in good condition, five were cured, two improved, and one benefited as far as reduction of residual urine. Of twelve cases complicated by marked pathological changes in the urinary tract, in men of advanced years who had reached the "break-down of catheter life," and some of whom had been subjected to castration, three were markedly benefited, practically cured;

seven continued to use the catheter but with comfort, and with improvement in general health in four, while two were unbene-fited.

This presentation would seem to justify positive affirmative conclusions as to the value of cauterization in proper cases, and to conclusively demonstrate that in early cauterization we have a safe and effective means of removing the factors of beginning obstruction, and thus to prevent those dreadful secondary processes which cause so much progressive annoyance, disability, and suffering which is frequently relieved only by death. If the further elapse of time will confirm the permanency of these results, then considerable of the air of doubt which now attains in the treatment of prostatic hypertrophy will have been dispelled.

If intravesical cauterization is efficient, is it equally indicated in all varieties and degrees of hypertrophy or only in a limited number? Even genito-urinary specialists seem to differ as to the scope of its application. Some, including Kreissl, of our own city, restrict its indication to true hypertrophy of only moderate degree of either or all of the three lobes. He believes prostatectomy indicated in true tumor formation and for pedunculated enlargement of the middle lobe. Young¹⁷ evidently believes it is indicated in all varieties of hypertrophy, even when there is valvular formation. Hor-witz¹⁸ states that the Bottini operation is indicated in all forms and characters of hypertrophy except when there is valvular formation or great enlargement of all three lobes with marked pouch formation. His conclusions are that the benefits of the operation are equally noticeable in all varieties of enlargement, the glandular or adenomatous as well as in fibroid hypertrophy.

Where the enlargements are situated in the lateral lobes and have extended towards the rectum, the perineal route would seem to be the natural one, while intravesical cauteriza-tion would hardly seem sufficient to cause atrophy and shrink-age of a growth far removed from the point of treatment. On the other hand, growths that project towards or into the bladder would seem to be best attacked from the vesical aspect,

preferably through a suprapubic cystotomy opening as first advocated by Belfield in this country and McGill in England.

Assuming, then, that these remarkable statistics and the universal indications are correct, and that the Bottini principle of galvano-cauterization effects the desired changes, have we in the Bottini method of operating through the urethra the safest, most reliable, and generally applicable method of cauterization?

It is unnecessary to go into anatomic details in connection with this subject before the members of this Society, and I will, therefore, merely state that one should keep in mind the relationship of the urethra, prostate, bladder, rectum, vascular plexuses, and other contiguous structures in considering the use and danger of any instrument or method of operating in this locality.

The following disadvantages and dangers of the Bottini operation are worthy of consideration:

(1) *Uncertainty in Diagnosis.*—The location and relationship of the prostate prevent its inspection, and ordinarily its complete palpation, even in the normal subject. The distortion of its form, the length and size of the urethra, and the relationship of the pelvic structures positively prohibit accurate determination of the exact extent and degree of involvement by the hypertrophic process in the majority of cases. The implication made by Horwitz that the diagnosis of the character of the enlargement and the cause of the obstruction can always be determined by rectal manipulation is refuted by all surgeons who have attempted to confirm their digital diagnoses by cystotomy. Even with the assistance of the cystoscope this is not always possible. Kreissl and others rely upon the sound and cystoscope for the diagnosis of enlargements extending towards the bladder. That the urethra is so elongated and distorted as to prevent cystoscopic examination is a fact of not infrequent observation. Furthermore, even when the cystoscope can be introduced, its presence alone should so modify the internal relationships about the vesical neck as to defeat the accurate determination of the factors producing the

obstruction. Rectal examination is of value in determining the condition of the enlargement extending towards the rectum. The sound and cystoscope are of value in some cases where the enlargement projects into the bladder, but in a considerable percentage of this form of enlargement suprapubic inspection and manipulations are absolutely essential to a positive diagnosis.

(2) *Unusual Knowledge and Skill in the Use of Electricity and the Special Instruments required.*—The successful performance of the Bottini operation requires a degree of familiarity with the manipulations and use of a delicate instrument, as well as with the effects of the strong electric current under peculiarly disturbing circumstances, which the ordinary experience of a general surgeon would rarely enable him to acquire. It will certainly not be claimed by anybody that the use of electricity in this manner is an absolutely safe procedure in the hands of every operator.

(3) *Uncertainty as to the Exact Location of the Beak of the Instrument.*—In the first place, without a positive anatomic diagnosis one would not know just where to place the beak of the instrument. Secondly, knowing the conformity of the parts, there are no means of our definitely determining the proper position of the instrument. Some operators claim that the finger placed in the rectum is sufficient, others that it is worthless. All admit having been mistaken even at times when they were positive as to the proper placing of the beak. Even placing the beak by the aid of a suprapubic opening does not insure its remaining there, as has been experienced by Eisendrath and others. The beak became caught in one of Freudenberg's cases and the cautery burned its way into the rectum, causing death.¹² All the conditions would naturally lead any one considering this subject in a judicial manner to conclude that the absolutely positive placing of the beak is impossible.

(4) *There must also be Uncertainty as to the Tissues in the Grasp of the Cautery.*—Even Freudenberg has incised a fold of the bladder,^{12, 18} which accident was followed by death.

Young¹² states that the beak has been drawn into the prostatic urethra several times, and that it had resulted in death in several instances by causing division of the membranous urethra, hæmorrhage, and extravasation. He claims having obviated the accident in several of his own operations by following Freudenberg's suggestion of rectal exploration with the finger before applying the current.

(5) *Uncertainty as to the Proper Length of the Incision.*—With an uncertain, and frequently mistaken, diagnosis as to the size and conformity of the enlargement, the length of the incision required cannot be definitely determined. Too long incisions are credited with having caused rupture of the membranous urethra and fatal hæmorrhage in several instances.¹²

(6) *Uncertainty as to Temperature of the Knife.*—All seem agreed that it should be kept at a white heat. Great difficulty has been encountered in securing the desired heat without endangering the adjacent structures and the urethral tract. Lewis has advised the use of air instead of water for distending the bladder in this connection. Young,¹⁹ claiming that this was due to faulty instruments, has devised new ones which he claims to be satisfactory. As the blade cannot be seen, however, there must ever remain marked uncertainty as to the degree of heat in the blade while in operation. This, according to von Frisch,²⁰ accounts for some of the failures of the operation.

(7) *The Uncertainty as to Destruction of the Tissue.*—Even with the requisite white heat assured, which as yet seems uncertain, there is the uncertainty as to the destruction of the tissue. Horwitz²¹ noted that longer time was required with each additional incision, and demonstrated that frequently a full minute was required after removal of the instrument to burn off the adherent tissue. He now removes the instrument after each cauterization. Von Frisch²⁰ claimed to have been unable in one case to penetrate an enormously enlarged gland with the blade. Unless the degree of heat is very high, it would seem very difficult, if, indeed, not impracticable, to

divide a very firm fibrous enlargement within a safe limit of time.

(8) *The Danger of Bending of the Blade.*—In 1895 I had the privilege of witnessing Professor Czerny, in Heidelberg, perform his first Bottini operation, and there I had the opportunity of noting this accident and observing its serious results. After making his incision, he attempted to return the knife into the beak, but encountered some difficulty, which, however, seemed to be overcome, and the instrument was withdrawn. It was noted that it required unusual traction to withdraw it, the cause of which was incidentally discussed but not definitely decided upon until complete withdrawal had been effected. When removed it was discovered that the blade was bent nearly at a right angle. The removal was, of course, followed by a profuse hæmorrhage, as the bent cautery-blade had split the urethra its entire length. The occurrence of this accident in the hands of this distinguished surgeon, whose reputation as a careful, painstaking operator—indeed, as a veritable master of operative technique—is of world-wide reputation, impressed me with this danger of the Bottini operation *via* the urethral route.

That the operation was distinctly an unsurgical procedure, I was fully convinced, and whenever opportunity has been afforded I have taken occasion to express that conviction. That it may have its sphere of application I am willing to admit, but that sphere is indeed small in my estimation.

(9) *Uncertainty as to Occurrence of Postoperative Hæmorrhage.*—Not knowing the point of origin of the hæmorrhage, mechanical measures for control are not applicable, and as yet we have no other reliable means by which we can check it.

(10) *Its Inapplicability in Pedunculated Projections.*—While it is generally claimed that the Bottini operation is not indicated in pedunculated projections, Young²² believes these can be modified by making bilateral cauterizations at the base. That this, however, is an uncertain and indefinite procedure must be apparent to every one, and the danger of completely

amputating the projection, and thus leaving it free in the bladder, is so imminent that there would seem to be no question as to the dangers of this procedure being prohibitive.

(11) *Its Inapplicability in Cases attended with Stricture of the Urethra, and also with Elongated and Narrowed or Distorted Prostatic Urethra.*—These are mechanical obstacles which absolutely prohibit the operation through the urethra while they exist. Unless the conditions are urgent, the first obstacle might be overcome by urethrotomy or divulsion. Newman²⁸ claimed that the instrument is difficult of introduction, and in many cases of hypertrophy the mechanical conditions rendered it non-introducible. Horwitz¹⁸ concurs in its not being usable in cases with elongated and narrowed prostatic urethræ.

(12) *Its Insufficiency*, in that it does not permit the treatment of other pathologic processes which may exist at the time in the bladder, viz., calculus, ulcer, papilloma, etc.

The twelve objections to the operation which I have referred to apply only to the use of the cautery through the urethra, as all will have noted.

The dangers of sepsis, thrombophlebitis, pulmonary embolism, etc., which have been raised to the operation^{12, 20, 24} might apply directly to the effect of the cauterization itself, and would, therefore, attend in some degree all methods of its application. However, as it is the accidents which usually cause the sepsis, etc., an indefinite understanding of the conditions present and the uncertain application of the variable cautery would render these complications more liable of occurrence.

The operation, being wholly in the dark and attended by so many dangers, has been looked upon as a decidedly unsurgical procedure by surgeons generally. It certainly fails to possess those elements of precision and of control which are essentially characteristic of perfect technique. Judging from the statements of the eleven members of this Society who have favored me with replies to my letter of inquiry concerning the Bottini operation, it has been employed by only two general

surgeons in this city. The danger of the operation is well illustrated in these instances, since in twenty-three cases two deaths resulted from accidental incision of the urethra with extravasation and sepsis, and one from uræmia.

It occurred to me in 1895, as it has undoubtedly occurred to others, that if the cauterization was productive of such salutary results as reported by even reliable men, why not apply it from above, through the bladder, and thus obviate all the uncertainties and dangers incident to the urethral route?

I have made diligent search in the literature without finding any reports of the cautery (galvanic or Paquelin) having been employed by this route for the treatment of prostatic hypertrophy, notwithstanding that this would appear to be the natural route. (While preparing this paper, Dr. Murphy has informed me of having used the Paquelin cautery in two instances with unsatisfactory results. I had hoped to present an analysis of Dr. Murphy's cases. Dr. Kreissl also informs me that it has been employed in Vienna and Paris.)

In August, 1900, I had occasion to perform the operation upon a very large man of seventy-six whose urethra was impermeable with the catheter. Upon making a median suprapubic cystotomy, we observed that an immense collar-shaped enlargement of all three lobes projected into the bladder nearly two inches. An incision was made posteriorly and laterally by means of the Paquelin. As it seemed unwise at that time to divide the prostate down to the bladder floor, and as there was a marked cystitis, suprapubic drainage was instituted. There were no ill effects from the operation, and by irrigation and the administration of urinary antiseptics the cystitis was soon controlled and the patient made comfortable, at which time he passed from observation. I understand that several months later he died from some acute complication, the nature of which I have been unable to ascertain. This was a case in which prostatectomy was indicated, but refused. Had we completely divided the collar below and incised it deeply in several radii, as we would now do, the result would undoubtedly have been much better.

In August, 1901, a patient was brought to me at the Monroe Street Hospital, by Dr. Pratt, of Indiana, who was suffering with

complete retention. He was sixty-eight years old, of good habits, and enjoyed fairly good health. He had experienced an increasing difficulty in urination for two years; had to get up two or three times each night of late. Urine came in a small stream and was attended by considerable pain. Four days previously he had taken a few glasses of beer, which brought on an acute urinary obstruction. This was relieved by the use of the catheter by the attending physician, and later by himself, but on the 9th of August this was unsuccessful, and he was brought to Chicago. Examination showed a distended bladder and a copious purulent discharge from the urethra. We succeeded in relieving the retention with the catheter. Rectal examination revealed enlargement of the left and middle lobes of the prostate. Having him in the hospital, where operative measures could be employed promptly if conditions demanded, I decided to attempt reduction of the acute inflammation of the bladder and urethra, if possible, before operating. Absolute rest in bed, urotropin internally, and boric-acid irrigations relieved the urethritis and cystitis markedly. In two weeks I made a suprapubic cystotomy,—utilizing the transverse incision,—having, of course, previously irrigated the bladder. The cut vesical edge was carefully protected, the bladder explored with the finger, and by use of retractors carefully inspected. A distinct bar formation was observed across the urethral orifice and only a slight bulging of the left lateral lobe. The bar was readily destroyed with the ordinary Paquelin point and a shallow groove burned into the left lobe. A No. 12 catheter was inserted, and the bladder wound closed by two rows of carefully applied continuous catgut sutures. The external wound was closed with a small precautionary capillary drain inserted through the abdominal wall, to be removed in seventy-two hours unless leakage occurred.

The subsequent history was absolutely perfect. A catheter was maintained in the urethra for four days and passed frequently for the following few days. The patient was allowed to be propped up in bed in a week. He returned to his home in three weeks without symptoms of obstruction, but with some cystitis. This increased, but the attending physician relieved it in three weeks, and since then the patient has been generally greatly improved. His physician reports that there is no obstruction and no residual urine now. The patient continues to be troubled

some with attacks of cystitis. This was present before the operation, frequently persists after any of the operations, and certainly is no more likely to occur after this operation than after the typical Bottini.

Briefly, the apparent advantages of the suprapubic or transvesical route are as follows:

(1) It admits of an accurate anatomicopathologic diagnosis which is fundamentally essential to intelligent treatment.

(2) The cauterization can be made with the galvanocautery or the more commonly possessed Paquelin cautery with ease, rapidity, and safety. A curved cautery-blade would greatly facilitate the procedure.

(3) The incision can be accurately placed.

(4) We can see the field of operation and the structures being cauterized.

(5) The length and depth of the incision can be regulated to meet the requirements in the particular condition found.

(6) The temperature of the blade is under direct ocular observation.

(7) The time of application can be regulated so as to insure destruction of the tissue, and if the Paquelin is used it can be applied with sufficient force and time to make the incision, regardless of the density of the tissue.

(8) There is no danger from bending of the cautery.

(9) If hæmorrhage does occur, its location can be definitely determined, and measures for its control intelligently and effectively employed, as has been demonstrated by Eisendrath.

(10) It is applicable to all forms of enlargement projecting into the bladder, and particularly so in the removal of pedunculated lobes or valve formations. A partial prostatectomy followed by cauterization would be an ideal procedure for such conditions.

(11) It is applicable in all cases regardless of urethral

obstruction. Such obstructions can frequently be readily removed from within.

(12) It admits of the removal of a calculus or the direct treatment of an ulcer. It also admits of suprapubic drainage if the cystitis seems to require it, or if the urethra is impermeable from within.

(13) It is not as likely to be followed by infection, phlebitis, sepsis, etc., as the uncertain urethral operation.

In short, it is a simple, rational, comparatively safe and satisfactory method of applying the cautery to prostatic enlargements projecting into the bladder. It would seem to bear practically the same relationship to the urethral operation as open herniotomy bears to the old blind method of dividing the constricting ring in strangulated hernia.

With careful operative technique and properly cared for catheter drainage the possibility of the establishment of a fistula is practically eliminated, particularly so when these patients are operated upon early, before secondary changes in the bladder have occurred.

The vesical mucous membrane and wound can be readily protected by compresses under retractors, and the collection of urine can be controlled by sponge compression or the use of the dentist's aspirator.

In contracted bladder this operation would be very difficult, and should, therefore, be avoided. As the Bottini operation is admittedly of no value in such cases, prostatectomy or perineal drainage should be employed if operating at all is determined upon.

This being an operation attended by some shock and considerable pain, a general anæsthetic would, of course, have to be employed. This might be positively contraindicated in some very old, feeble, and nephritically septic patients, and in these the urethral route would probably be indicated. However, in this extreme class of cases, which will rapidly grow smaller since prostatic surgery is now rapidly progressing, simple vasectomy under local anæsthesia offers quite as much encouragement as the Bottini operation.

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